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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/729,657

12/05/2003

Ching-Fuh Lin

IAM03195

2811

7590

11/03/2005

Bo-In Lin

13445 Mandoli Drive

Los Altos Hills, CA 94022

EXAMINER

FLORES RUIZ, DELMA R

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/729,657

Applicant(s)

LIN ET AL.

Examiner

Delma R. Flores Ruiz

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5 - 17 and 19 -28 is/are rejected.
- 7) ☒ Claim(s) 4 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## ***DETAILED ACTION***

### ***Specification***

The disclosure is objected to because of the following informalities: Applicant is reminded that has the duty to disclose including the related applications to the current application, for example, applicant fails to disclose the co-pending related applications 10/729,411, 09/974,420, 10/216,711 and 10/729,657 See ***MPEP 704.12(a) [R-2]*** and ***37CFR § 1.56***.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(f) he did not himself invent the subject matter sought to be patented.

Claims 1 – 28 are rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter. The current application is directed toward the same inventive features as the co-pending application 10/729,657, wherein the current application has an additional inventor. The examiner suggests clarifying the inventorship of the inventor Yi-Shin Su in the current application.

Claims 1 – 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin (US2004/0259284).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

**Regarding claims 1 and 15**, Lin discloses a apparatus and method of wavelength-tunable semiconductor laser, comprising: a semiconductor substrate, however, it is understood that Lin teaches a substrate for the laser to support the other layers. Therefore, a substrate is considered inherently disclose since said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a substrate; and at least two types of

quantum well structures formed on the semiconductor substrate, each of which provides a different luminescent wavelength, wherein if the sum of a hole diffusion time plus a hole capture time is larger than the sum of an electron diffusion time plus an electron capture time, the quantum well structures are arranged in a manner that the quantum well structure located in the proximity of a P-type semiconductor side has a relatively high two-dimensional density of states, and if the sum of an electron diffusion time plus an electron capture time is larger than the sum of a hole diffusion time plus a hole capture time, the quantum well structures are arranged in a manner that the quantum well structure located in the proximity of an N-type semiconductor side has a relatively high two-dimensional density of states (Paragraph 34).

***Regarding claims 2 and 16***, Lin discloses a each type of the quantum well structures includes at least one quantum well, (Paragraph 10).

***Regarding claims 3 and 17***, Lin discloses each type of the quantum well structures is formed from different materials (Figs. 3 and 6, (Paragraph 38).

***Regarding claims 5 and 19***, Lin discloses each type of the quantum well structures is formed from different width (Paragraphs 10, 14).

**Regarding claims 6 and 20**, Lin discloses each type of the quantum well structures is differentiated from one other in terms of different width, a two-dimensional density of states of the quantum well structures is calculated based on the energy levels of the quantum well structures, and is derived from a first quantized density of states of the quantum well structures (Paragraphs 28 and 30).

**Regarding claims 7 and 21**, Lin discloses different luminescent wavelengths are obtained by stacking quantum well structures of different types based on the difference between the energy levels of the quantum well structures (Paragraphs 27 and 43 ).

**Regarding claims 8 and 22**, Lin discloses the arithmetic model is used to determine which carrier is the dominant carrier (Paragraphs 32 and 33).

**Regarding claims 9 and 23**, Lin discloses a  $T_{p, total} > T_{n, total}$ , electrons are sufficient to enter the two-dimensional energy level of the quantum well structures earlier and thereby result in a higher electron density in the proximity of a N-type semiconductor side, and holes that enter the two-dimensional energy level of the quantum well structures later is similarly distributed according to the distribution of the electrons, so that the two-dimensional carrier distribution in the proximity of the N-type semiconductor side within the multi-layer quantum well structures is relatively high, and the quantum well structures are arranged in a manner that the quantum well structure

located in the proximity of a P-type semiconductor side has a relatively high two-dimensional density of states (Paragraph 34).

**Regarding claims 10 and 24**, Lin discloses a  $T_{p, total} > T_{n, total}$  holes are sufficient to enter the two-dimensional energy level of the quantum well structures earlier and thereby result in a higher hole density in the proximity of a N-type semiconductor side, and electrons that enter the two-dimensional energy level of the quantum well structures later is similarly distributed according to the distribution of the holes, so that the two-dimensional carrier distribution in the proximity of a P-type semiconductor side within the multi-layer quantum well structures is relatively high, and the quantum well structures are arranged in a manner that the quantum well structure located in the proximity of a N-type semiconductor side has a relatively high two-dimensional density of states (Paragraph 34).

**Regarding claims 11 and 25**, Lin disclose the uniformity of carrier distribution within the quantum well structures is related to the two-dimensional energy density of the quantum well structures, and the carrier distribution within the quantum well structures is affected according to the determination of the dominant carrier within the quantum well structures (Paragraph 35).

**Regarding claims 12 and 26**, Lin discloses the two-dimensional density of states of the quantum well structures is closely related to the width and composition of the quantum well structures, and if the quantum well structures are designed using different semiconductor materials and width specifications and occupy similar quantized energy levels, the difference between the two-dimensional energy level densities is generated from the composition of the quantum well structures, and wherein the two-dimensional density of states of the quantum well structures is influential on the uniformity of carrier distribution within the quantum well structures (Paragraph 38).

**Regarding claims 13 and 27**, Lin discloses the composition of the quantum well structures is selected from III-V semiconductors used in an optical communication system (Paragraph 44).

**Regarding claims 14 and 28**, Lin discloses the quantum well structures are formed from one group of II-VI semiconductors, III-V semiconductors, and IV semiconductors (Paragraph 44).

***Allowable Subject Matter***

Claims 4 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



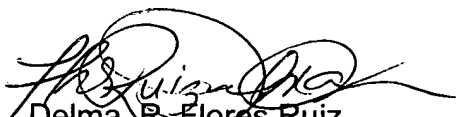
Art Unit: 2828

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (571) 272-1940. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Sun Harvey can be reached on (571) -272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Delma R. Flores Ruiz  
Examiner  
Art Unit 2828

  
Min Sun Harvey  
Supervisor Patent Examiner  
Art Unit 2828

DRFR/MH  
October 26, 2005

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